

REMARKS

Applicants have carefully considered the matters raised by the Examiner in the Final Rejection dated August 13, 2003 but remain of the opinion that patentable subject matter is present. Applicants therefore have filed an RCE and respectfully request reconsideration of the Examiner's position based on the above amendments to the claims and the following Remarks.

Claims 1-20 are pending in this case. In this Amendment, Claims 6 and 7 have been amended to use the transitional phrase "consisting of", and Claims 1, 3, 6, and 14 have been amended to recite that microsilica is an amorphous particulate having a size of about 0.15  $\mu\text{m}$ , containing at least 70% by weight  $\text{SiO}_2$  and obtained from a gaseous phase from the reduction of silica. Support for the microsilica limitations can be found on page 2, lines 14-24 of the Application.

This microsilica is obtained through the reduction of silica and is extracted from the vapor phase during the reduction reaction. Typically, this microsilica is obtained as a by-product from a silica furnace where quartz

is reduced to silicon and the microsilica is obtained from the gas filters of the smoke stacks of the furnace. This microsilica had previously been considered to be a nonusable, by-product, however, Applicants Assignee has done extensive research into ways of utilizing this by-product in order to bring it back into the stream of commerce. This Application is one result of the extensive research that Applicant has done.

In the previous Office Action, the Examiner had rejected Claims 6 and 7 as being anticipated by Clarke. As brought out by the Examiner in the Office Action at paragraph 7 on page 3, Clarke's inorganic filler comprises a three component system: (1) a sub-micron fraction, (2) a 1-50 micron fraction, and (3) a 50 to 250 micron fraction. The submicron fraction can be microsilica, the 1-50 micron fraction can be talc and the 50-250 micron fraction is sand.

As noted above, Claims 6 and 7 have been amended herein to recite that the filler "consists of" talc and microsilica. Thus, the filler of Claims 6 and 7 is a two-component system and because of the closed end nature of the transitional phrase "consisting of", the three-

component system of Clarke is excluded from the claimed subject matter. Respectfully, Claims 6 and 7 are patentable over the teachings of Clarke.

Claims 1-14 and 16-19 had been rejected as being unpatentable over Sack while Claims 15 to 20 had been rejected as being unpatentable over a combination of Sack and Lundgard. It is Applicants contention that Claims 1-20 are patentable over the teachings of Sack and Lundgard taken alone or in combination because: (1) neither Sack nor Lundgard teach the specific combination of microsilica and talc, (2) neither Sack nor Lundgard teach the microsilica of the present Invention and (3) the combination of microsilica talc as taught in the present Invention are synergistic.

Sack and Lundgard teach polymer compositions that contain a polymer and other components such as fillers but neither teach the specific combination of talc and microsilica and neither teach the specific microsilica of the present Invention.

Sacks mineral carriers are recited at Column 3, lines 39-44, none of which are microsilica. In Examples 3 and 4, Sack teaches that microsilica is used in conjunction with sand, cement and quartz flour (Example 3) or chalk (Example 4). In claim 5, Sack recites that microsilica, talc along with thirteen other minerals can be used, however, nowhere does Sack specify that talc and microsilica are used in combination.

Furthermore, Sack's "microsilica" is not the same as the microsilica of the present Invention. Sack's microsilica as taught in Examples 3 and 4 have a particle size of 1  $\mu$ . This material is clearly not the microsilica of the present Invention which is defined in the Claims, i.e. having a size of about 0.15  $\mu$ .

The microsilica in Sack is too large to be the same microsilica claimed in the present Invention. As pointed out above, the microsilica of the present Invention has a particle size of 0.15  $\mu$ . This is 10 times smaller than the microsilica referred to in Sack. Thus, it is submitted that Sack is missing the microsilica of the claimed Invention because its particle size is too large for that the present Invention.

With respect to Lundgard, he refers to some 20 fillers but none are microsilica, albeit he recites fumed silica and silica or glass, see Column 13, line 19. Both of these products are deemed not to be the microsilica of the present Invention since neither is referred to as microsilica and Lundgard does not teach what is "fumed" silica.

Thus, it is submitted that neither Lundgard nor Sack teach nor suggest using the microsilica which is recited in the claims of the present Invention or the specific combination of talc and microsilica.

The combination of microsilica and talc are synergistic because they provide both good results for stiffness and impact strength, albeit that the results are not necessarily synergistic for both tensile strength and impact strength.

First, the Examiner has pointed out that polyolefin compositions are notoriously known for being incompatible with fillers such as talc and silica. This fact is also brought out on the first page of the Application in paragraph No. 5. As stated therein, stiffness obtained

using talc alone as a filler is substantially reduced when adding a second filler for increasing the impact strength.

Applicants have tested a polyolefin, namely, polypropylene and the tests results are contained in the Application in Example 1. The data from Example 1 is illustrated in Figures 1 and 2 of the Application.

Directing the Examiner's attention to Figures 1 and 2, it can be seen that the combination of talc and microsilica as a filler, in each case, produces both stiffness and impact strength which are greater than the average of the combined stiffness and impact strength for talc or microsilica alone. For example, at 5% of a mineral load as shown in Figure 1, the combined talc and microsilica had a stiffness of greater than 1400. Since talc alone had a stiffness of about 1500, and microsilica alone had a stiffness of about 1300, the average for the two would be approximately 1400. Thus, at a 5% mineral load, the talc and microsilica shows synergism for tensile strength.

Turning the Examiner's attention to Figure 2, the same can be said that the 5% mineral load for impact strength. The impact strength for talc at a 5% mineral load is about

44. The impact strength for microsilica at a 5% mineral load is 50. The average of microsilica and talc alone at a 5% mineral load is thus 47. From Figure 3, it can be seen that the impact strength of the combined talc and microsilica is about 48. Thus, it can be said at a 5% mineral load that the impact strength for the combined talc and microsilica is synergistic because it is better than the average of the two taken alone.

Thus, with the notoriously known incompatibility of fillers such as talc and silica in polyolefins, Applicants have discovered that the combined talc and microsilica gives surprisingly high stiffness and high impact strength to the polyolefin.

Thus, Example 1 shows, not only that at a filler level of 5%, synergism exists but, also, that the filler of the present Invention works in polyolefins.

In conclusion, Applicants submit that their test data, as presented in the Application, does show synergism at the lower range of 5% and that the test data, as presented in Example 1, shows this synergism for polyolefin compositions; that the microsilica, as recited in the

claims, is not the same microsilica or silica as taught in Sack and Lundgard; and that neither Sack nor Lundgard taken alone or in combination teach the specific filler of talc and microsilica as recited in the claims herein. Applicants respectfully request that their claimed Invention is patentable over the cited references taken alone or in combination.

In view of the foregoing, it is respectfully submitted that the Application is in condition for allowance and such action is respectfully requested. Should any extensions of time or fees be necessary in order to maintain this Application in pending condition, appropriate requests are hereby made and authorization is given to debit account #02-2275.

Respectfully submitted,

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